

**TAG: Learning Set 1.7**  
**Design a Procedure**

Name \_\_\_\_\_  
Hour \_\_\_\_\_ Date \_\_\_\_\_

**Speed Trials**

Read p. 57.

What will you be exploring in this section?



Read “Velocity” section on p 57.

What is the difference between speed and velocity?

**Conference:** Answer the following questions with your table group. Be prepared to share your answers with the class.

1. What is speed? What are some examples of things that commonly have their speed measured?
2. How is the speed of an object usually measured:
  - a. A car?
  - b. A runner in a race?
  - c. An airplane?
  - d. A ship at sea?
3. What are the two values that are always part of the units used to describe speed?

What mathematical relationship between these two values is expressed as speed?

Write out a mathematical equation describing the relationship between speed and these two values.



**Communicate**

Share your answers with the class.

Read “Average Speed” on p. 58.

What units will you measure your coaster car speed in?

What do you need to know to calculate average speed?

What is the formula used to calculate average speed?

Calculate the average speed of a motorized car that travel 24 meters in 8 seconds? (Show your work!)

In a distance-time graph:

- a. what variable is on the x-axis?
- b. what variable is on the y-axis?
- c. what does a straight diagonal line indicate?
- d. what does a straight horizontal line mean?
- e. what does the steepness of slope indicate?

### Plan

Read pp. 60-61. As you plan your performance test, keep in mind the answers to the bulleted questions on pp. 60-61.

Record your procedure.

Step	
1	
2	
3	
4	
5	
6	
7	



## Communicate

Create a poster with your group that includes the following information:

- What you are measuring
- The materials and tools that you need for your test
- The set-up, including all reference points
- The procedure
- Why you think it can be used in a fair test

Also, be prepared to share your answer the following questions about your procedure with the class:

- Why do you think your procedure is repeatable?
- How does your procedure keep all test factors the same?
- How can you be sure you will get reliable measurements during testing?
- What factors are the most difficult to keep the same each time you conduct the procedure?
- How can the procedure help you evaluate a coaster car's performance?
- How can the results of using your procedure be used to increase a coaster car's speed?



**STOP!** And listen for your Teacher's directions of how to Share your Posters.

## Revise Your Plan

Record your class procedure.

Step	
1	
2	
3	
4	
5	
6	
7	



## Reflect

1. Why is it important that all groups make the same measurements in the same way? Why is it important that all of the groups use the same units for each measurement?
2. What parts of the procedure did all of the groups agree upon in order to design a repeatable test to measure speed? Why was each important?
3. How many trials of the performance test do you think that each group needs to conduct to get the most accurate results? Why?

## Conduct Your Speed Trials

Use the procedure designed by the class to measure the speed of your car. Record your data for each trial that you conduct. Average your results and be prepared to share them with the class in a solution briefing.



## Communicate: Solution Briefing

Follow your teacher's directions for how to complete the Solution Briefing.



## Reflect

1. Why is it important to perform several trials?
2. Why is it important to use the same tools and unit of measurement for each trial?
3. If you had the chance to change your car to make it go faster, what would you do?
4. Describe the relationship between friction and speed:
5. Describe the relationship between speed and velocity:

## What's the Point?



Read the bottom of pg. 64. Fill in the blanks to complete the following important ideas from this section.

You know that you must use a repeatable procedure when measuring and comparing different speeds so that means you must use the same: \_\_\_\_\_ and \_\_\_\_\_ and that measurements for distance and time must be taken \_\_\_\_\_ for every trial.